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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,873	01/07/2002	Darryl D. Amick	MOF 304	4960

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EXAMINER
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JENKINS, DANIEL J

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/041,873

Applicant(s)

AMICK, DARRYL D.

Examiner

Daniel J. Jenkins

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14, 16, 17, 20-22, 27-31, 34-39, 41-58 and 63-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16, 17, 20-22, 27-31, 34-39, 41-58 and 63-76 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

1. The Examiner has carefully considered Applicant's Response of 10/5/05. At this time, the Examiner provides new argument to the record, finding that the primary reference to Mravic et al. can be used to provide the tin component, instead of relying upon the West reference. This Action is accordingly not made final.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 6-9, 12-13, 14, 16, 17, 20, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187 in view of WO 00/37878 (Beal) and West et al.

Mravic et al. '187 discloses the invention substantially as claimed at claims 1 and 2 and the accompanying disclosure.

Mravic et al. '187 discloses a frangible projectile comprising:

a W or ferrotungsten component (col. 8, lines 12-15);

a second metal component selected from a group comprising Sn (col. 8, lines 16-18); and

a polymer binder (see claim 2).

The Examiner finds that the use of Sn as the second metal is not inconsistent with the body of the disclosure of the patent to Mravic et al. '187. In particular, Mravic '187 discloses at col. 2, lines 29-31, that "filler metal such as iron powder or zinc powder" can be added to the tungsten component (emphasis added by Examiner). Thus, although

the specification of Mravic et al. '187 is not directed to Sn, it is not inconsistent with claims 1 and 2.

In the alternative, even if motivation is lacking to select Sn as a filler in the invention of Mravic et al. '187, Beal teaches that Sn is an available filler material, as well as iron and zinc, in the same field of endeavor, providing motivation to further select Sn as an obvious equivalent substitution material for iron and zinc.

The Examiner notes that both interpretations are to elemental Sn.

Mravic et al. '187 discloses wherein the polymer binder is selected from a group of thermosetting resin (col. 5, lines 47-49), and Table 1, Code 1 and 2).

Mravic et al. '187 discloses in Examples (CODE) 1 and 2, wherein the polymer binder is in amounts of 2.5% and 1.6%, respectively, thus providing examples within Applicant's claimed range establishing a prima facie case of obviousness.

The Examiner notes that the desired density of the formed projectile would direct one of ordinary skill to small amounts of polymer binder in the projectile.

Mravic et al. further discloses wherein the desired density of the formed projectile should approximate that of Pb (11.4 g/cc) (see col. 3, lines 33-36), and provides an example of a polymer matrix wherein the density is approximately 10.4 g/cc (see Table 1, Code 2) (The Examiner does acknowledge that this example was for a single metal constituent, but does not find this precluding of the motivation to approximate the density of lead with a polymer binder).

Mravic et al. '187 is silent as to using the projectiles as part of ammunition.

West et al. disclose wherein a projectile is part of a ammunition comprising known cartridge components comprising firing pin, case, primer, and propellant (col. 3, lines 24-33) in the same field of endeavor for the purpose of using non-lead projectiles in range ammunition, with one of ordinary skill in the art knowing that ammunition means cartridges of shotgun and rifle, the projectile being formed into the appropriate shape of bullet or shot for each application.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use the components of West et al. with the projectile of Mravic '187 in order to form non-lead range ammunition.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187.

Mravic et al. '187 discloses the invention substantially as claimed (see paragraph 3 above).

However, Mravic et al. '187 does not provide motivation to obtain density in excess of Pb.

Robinson et al. teaches in the same field of endeavor that projectiles can be formed with higher densities than Pb in order to improve stopping powder (col. 4, lines 8-10), and that increased density can be imparted by increasing the amount of the high density component. Robinson et al. further discloses wherein the density can be increased to between 12 g/cc and 14/g/cc.

Art Unit: 1742

It would have been obvious to one having ordinary skill in the art at the time of the invention to increase the tungsten component in the invention Mravic et al. as taught by Robinson et al. in order to increase the density of the formed projectile to between 12-14 g/cc in order to improve the stopping power of the formed projectile.

5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187.

Mravic et al. '187 discloses the invention substantially as claimed (see paragraph 3 above).

Mravic et al. '187 further discloses wherein the projectile further comprises a jacket (col. 5, lines 28-40).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187.

Mravic et al. '187 discloses the invention substantially as claimed (see paragraph 3 above).

Mravic et al. '187 further discloses wherein the plastic matrix projectile is frangible (col. 5, lines 60-63).

7. Claims 1, 11, 27-31, 34, 35, 37, 38, 39, 41-51, 54-58 and 63-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amick '981 in view of Lowden et al. '331., and further in view of Mizuno et al.

Amick '981 discloses the invention substantially as claimed. Amick '981 discloses a method of making a projectile comprising:

- providing a tungsten powder constituent(col. 7, line );
- adding a second metal powder to form a mixture (col. 3, lines 1-2 and 18-25)
- further adding a binder and lubricant to the mixture (col. 7, line 22); and
- sintering said mixture to form a projectile (col. 7, line 24).

However, Amick '981 does not disclose adding Sn as the second metal, but provides examples of iron, copper and aluminum, and further states "other suitable metals" (col. 7, line 33) can be used.

Lowden '331 teaches that Sn, as well as aluminum and copper can be used as a metal constituent (col. 6, lines 16-25) in the same field of endeavor as functional equivalents. It would have been obvious to one having ordinary skill in the art at the time of the invention to use Sn as a binder metal in the invention of Amick '981 in place of copper or aluminum, since Lowden '331 teaches these as functional equivalents.

Amick '981 is silent as to the type and amount of binder material.

Mizuno et al. teaches using thermosetting resins in amounts of 0.2 to 16% in the field of metal powder sintering (col. 3, lines 27-43) for the purpose of forming formed metal powder compacts.

Mizuno et al. further provides an example of binder in an amount of 0.5% (col. 4, lines 49), further disclosing the low end of the binder amount.

The Examiner finds that the sintered projectile of the resultant combination results in a projectile which meets the limitation to infrangible.

Art Unit: 1742

The Examiner finds that to jacket a sintered bullet is well known in the art to reduce barrel wear.

8. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187.

Mravic et al. '187 discloses the invention substantially as claimed (see paragraph 3 above).

Mravic et al. '187 further discloses wherein the tungsten component is selected from a group comprising tungsten and ferrotungsten.

9. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. '187.

Mravic et al. '187 discloses the invention substantially as claimed (see paragraph 3 above).

However, Mravic et al. '187 is silent as to the range of the second metal constituent, but provides an example of 15% iron.

The Examiner finds that one of ordinary skill in the art, in light of the overall disclosure of Mravic et al. '187 to obtain densities approximating or exceeding lead, would be necessitated to using less than 15% of the second metal constituent in order to obtain high density projectiles.



10. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amick '981 in view of Lowden et al. '331., and further in view of Mizuno et al., and further in view of Elsner et al.

Amick '981 discloses the invention substantially as claimed. However, Amick '981 does not disclose wherein the sintered body is used as a golf club weight.

Elsner et al. teaches that sintered tungsten based inserts are known as golf club weight inserts because of their high density.

It would have been obvious to use the method of Amick '981 in view of Lowden et al. '331., and further in view of Mizuno et al. to form golf club weights as taught by Elsner et al.

11. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amick '981 in view of Lowden et al. '331., and further in view of Mizuno et al., and further in view of Bray et al. '379.

Amick '981 discloses the invention substantially as claimed. However, Amick '981 does not disclose wherein the sintered body is used as radiation shielding.


Bray et al. '379 teaches that high density sintered tungsten can be used for both projectiles and radiation shielding.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use the high density tungsten material of Amick '981 in view of Lowden et al. '331., and further in view of Mizuno et al. as a radiation shielding material as taught by Bray et al. '379 in order to provide a lead substitute.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Jenkins whose telephone number is 571-272-1242. The examiner can normally be reached on M-TH6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1242. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel J. Jenkins  
Primary Examiner  
Art Unit 1742

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